

Capodemus, a new genus of Blissinae from South Africa with
the description of twelve new species
(Hemiptera: Lygaeidae)*

by

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The new genus, *Capodemus*, is described for the type-species, *Blissus rusticus* Stal, and fourteen other South African species, of which twelve are new, namely, *bispinosus*, *wilcoxae*, *stuckenbergi*, *variabilis*, *tenuatus*, *sabulosus*, *elegiae*, *herbosus*, *distinctus*, *pentameri*, *hirsutus*, *rusticoides*. *Ischnodemus darwini* Slater and *Blissus rostratus* Slater are transferred to *Capodemus*.

Our collecting experience in South Africa in 1967–1968 has made it evident that the taxon that has been known for many years as *Blissus rusticus* Stal is actually a complex consisting of a number of distinct although closely related species. Slater (1964) pointed out the heterogeneity of the South African species placed in the genus *Blissus*, listed a number of species “groups” and noted that *B. rusticus* and *B. rostratus* were closely related and very distinct from other species placed in *Blissus*. *Ischnodemus darwini* Slater, which was described in the same paper from a single macropter, belongs to the same complex. Slater (1964) did not recognize the relationship of *darwini* to *rusticus* due to the extreme modifications associated with brachyptery in this complex. Prior to our personal field collecting only eleven specimens of this complex had been studied. We have been able to study approximately 500 adults and several hundred nymphs. Study of this material indicates that a number of distinct species are represented. These species share a number of characters and represent a distinct genus in the subfamily Blissinae.

CAPODEMUS gen. nov.

Head and pronotum largely shining, punctate, thoracic pruinosity variable, always present on anterior lobe of propleuron and sternum, usually also present on posterior propleural area and frequently extending dorsad onto lateral areas of dorsal surface of pronotum (fig. 12); scutellar pruinosity either extending on either side of meson to distal end or confined to anterior $\frac{1}{2}$ to $\frac{1}{3}$; hemelytra not shining, apical corial margin straight in macropters (fig. 1); brachypters with wing pads reduced to minute

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acuminate (fig. 8) or rounded (fig. 10) pads extending at most to anterior portion of 2nd abdominal tergum, and widely separated mesally, with clavus and corium not differentiated, usually a very narrow rim of membrane present; metanotum transversely striate (figs 14, 16); fore femora incrassate, mutic, or with 1 or 2 small spines on distal $\frac{1}{2}$ below; fore coxal cavities very narrowly open (fig. 9); metathoracic scent gland auricle small, rounded or subacute at distal end; mesosternum convex, shallowly concave or with a deep median longitudinal furrow; antennae terete, 4th segment fusiform; claspers conventional with outer lobe placed close to base (fig. 5); sperm reservoir small, ovoid, with small slender divergent wings; phallus generally with trifid gonoporal process, ring sclerite, small laterally directed lobes on distal margin of phallotheca and with articulation of basal apparatus lateral rather than apical; sterna 3 and 4 with only 2 trichobothria present on each side; inner laterotergites present on segments 3 to 7, the 7th very slender, membranes of equal width on either side of tergites; females with tergum 9 and associated paratergite forming a single continuous sclerite.

Type species: *Blissus rusticus* Stål

The systematic position of *Capodemus* is of great interest and importance to an understanding of the phylogeny of the Blissinae. We believe it to represent in many respects a very generalized taxon. The relationships will be dealt with in detail in a forthcoming contribution to the phylogeny of the entire subfamily.

For the present we point out that the open fore coxal cavities, straight apical corial margin, terete antennae and generalized claspers and sperm reservoir constitute a group of plesiomorphic characters which together with the retention of a degree of prothoracic pruinosity is perhaps only exceeded by an, as yet, undescribed species from the mountains of Burma. It appears to us that *Capodemus* is similar to the common ancestor from which such relatively generalized taxa as *Ischnodemus* and an undescribed genus which will be erected to contain "Blissus" *diplopterus* and its relatives have been derived.

It is evident that this genus has been isolated and evolving independently for a long time. Within the genus occur a number of the same inter-specific differences that occur as independent evolutionary events in *Ischnodemus*, *Dimorphopterus* and other genera. Examples are the presence or absence of fore femoral spines, relative lengths of the labium, presence or absence of a median longitudinal mesosternal furrow, reduction of the pronotal and scutellar pruinosity and variation in eye shape and antennal length.

The cohesiveness of the genus is also striking, especially in the similar general body habitus, the surprising uniformity shown by all species in the appearance of the strongly micropterous front wings, and in the relatively small degree of pruinosity differentiation.

Further evidence to support both the cohesiveness of the genus and its antiquity is that species which are very similar to one another morphologically have been able to adapt themselves to hosts in a number of genera of quite distinct monocotyledonous families (Gramineae, Restionaceae and Cyperaceae).

All of the species of *Capodemus* are restricted in distribution to the southern Cape Province in South Africa, in an area coincident with the distribution of the unique Cape macchia floral assemblage. Within this stable and distinctive area the genus has undergone intensive speciation and has adapted itself to a wide range of host plants.

The taxonomic status to be accorded the various populations of *Capodemus* is a very difficult problem and one that will require a great deal of additional field work

before it is finally resolved. We have decided to adopt a conservative approach in the present paper and to recognize as species only those populations where we consider very distinct morphological differences are present. Fortunately we have had long series available for some species which has enabled us to study the variation present. This has been particularly valuable in assessing the significance of differences in populations from which only a few specimens have been available for study. In a number of cases we have refrained from describing as species specimens which may ultimately prove to be distinct. To draw attention to these populations we have treated them separately at the end of the text in the hope that they can be assigned to species when additional material becomes available. There is little question but that additional species of *Capodemus* will be taken in the southern Cape. We look upon this paper as an introduction to a very complex situation. We hope this contribution will indicate the extent of the problem, point up the nature of what we consider to represent specific differences and set forth some of the areas within the genus where additional study and analysis will be necessary when more material has been accumulated.

The nymphal stages and host plants are of much importance to an understanding of the systematics of this genus. In all cases where we have been able to recognize discrete species based on adult characters and where nymphs are available, we have also been able to distinguish the nymphs by a different set of characters. Differences in host plants suggest that in several cases where we have refrained from describing species, several distinct species will probably ultimately prove to be involved. Study of this complex by a resident biologist certainly will yield results of considerable general phylogenetic, ecological and taxonomic importance.

TAXONOMIC CHARACTERS

Characters that have proven to be of major importance in the classification of species of *Ischnodemus* have been described in detail by Slater & Wilcox (1969) and Slater & Harrington (1970). Of these the condition of the pruinosity on the prothorax and scutellum, the presence or absence of fore femoral spines, the pubescence, eye shape, labial length and mesosternal condition have proven to be most useful in segregating species of *Capodemus*. The sperm reservoir, claspers and spermatheca, while occasionally showing small degrees of difference, are of limited value in this genus. We believe this is evidence of the close relationship that exists between species of this complex. The metathoracic scent gland auricle is sometimes acuminate distally, sometimes rounded, but the differences are often subtle and difficult to use unless comparative material is available. The labial length and the mesosternal furrow differ between certain species within the genus but are not useful to distinguish extremely closely related species.

The pruinosity of the prothorax is very important in specific recognition in this genus. We have designated the lateral area of the prothorax as the propleuron, although technically it is probably the notum, to distinguish this area from the dorsal surface.

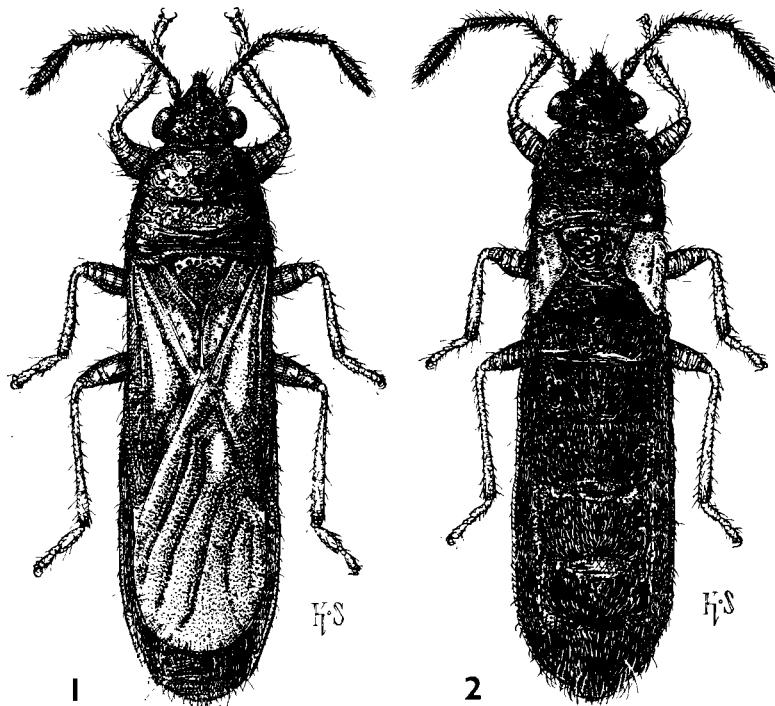
KEY TO SPECIES OF *CAPODEMUS*

- | | | |
|---|--|------------------|
| I | Labium very elongate, extending posteriorly beyond metacoxae | rostratus |
| — | Labium shorter, never exceeding metacoxae, usually not extending caudad of mesocoxae | 2 |

2	Fore femora with 1 or 2 small spines present below on distal half (often the spine is very small)	3
—	Fore femora mutic	7
3	Fore femora with two distinct spines present	bispinosus
—	Fore femora with only a single small spine present	4
4	Pruinosity on scutellum laterad on either side of midline extending nearly to posterior end of scutellum	5
—	Pruinosity on scutellum limited to anterior $\frac{1}{2}$ to $\frac{1}{3}$	6
5	Acetabula shining; posterior margin of propleural area of prothorax with a narrow marginal shining strip	wilcoxae
—	Acetabula pruinose; propleural area completely pruinose including posterior margin	stuckenbergi
6	Prothoracic pruinosity extending dorsally above a dark shining bar near dorsal margin of propleural area onto lateral area of dorsal surface (fig. 11)	variabilis
—	Prothoracic pruinosity not present above shining lateral bar, thus not present laterally on dorsal surface (fig. 13)	tenuatus
7	Scutellar pruinosity laterad of midline extending posteriorly to or nearly to posterior end of scutellum	8
—	Scutellar pruinosity limited to anterior $\frac{1}{2}$ to $\frac{1}{3}$ of scutellum	12
8	Posterior propleural area shining and non-pruinose adjacent to margin; mesosternum with a conspicuous longitudinal furrow present	darwini
—	Propleural area completely pruinose to posterior margin; mesosternum lacking a conspicuous longitudinal furrow	9
9	Brachypters with wing pads rounded at distal end (fig. 10)	sabulosus
—	Brachypters with wing pads acuminate at distal end (fig. 8) (macropters unknown)	10
10	Head relatively elongate, exceeding distal end of 1st antennal segment; pronotal pruinosity extending mesally across transverse impression to mesad of level of ocelli (fig. 12)	elegiae
—	Head relatively short, usually not exceeding distal end of 1st antennal segment; pronotal pruinosity not strongly developed across transverse impression mesad of ocelli	11
11	Eyes large and ovoid (fig. 17)	herbosus
—	Eyes smaller and subelliptical (fig. 15)	distinctus
12	Prothoracic pruinosity not extending dorsally above shining bar (fig. 13); posterior lobe of propleural area completely shining; acetabula shining	pentameri
—	Prothoracic pruinosity extending dorsad of shining bar onto lateral portion of dorsal surface (fig. 11); posterior propleural area pruinose; at least fore acetabula pruinose	13
13	Meso- and meta-acetabula shining; dorsal surface densely clothed with elongate somewhat woolly pubescence	hirsutus
—	All acetabula pruinose; dorsal pubescence relatively short and decumbent	14
14	Transverse striae on metanotum coarse, only 3–4 striae visible (fig. 14); scutellum deeply foveate laterally; brachypters with pronotum relatively short, subequal to length of 4th antennal segment; fore coxae almost closed posteriorly (opening 0,015 mm)	rusticoides
—	Transverse metanotal striae fine, 9–10 striae visible (fig. 16); scutellum weakly foveate laterally; pronotal length greater than length of 4th antennal segment; fore coxae more widely open posteriorly (opening 0,05 mm)	rusticus

***Capodemus bispinosus* spec. nov., fig. 6**

Macropterous; head and pronotum black, strongly shining; pronotum weakly pruinose laterad of level of ocelli, becoming dark castaneous across humeral area of posterior pronotal lobe; scutellum shining black over greater part of disc, pruinose on anterior $\frac{1}{3}$ only; hemelytra dull in contrast to head, pronotum and scutellum, with exception of shining radial vein, ground color of hemelytra sordid testaceous, becoming darkened to red-brown or nearly black on basal $\frac{2}{3}$ and marginally along claval commissure as well as entire post cubital vein, on corium entire apical $\frac{1}{3}$ and a prominent elongate vitta running on either side of and including radial vein to nearly its basal $\frac{1}{3}$, giving a dusky appearance to corium; membrane white, veins unicolorous or very slightly infuscated with extremely light tan; antennae very dark castaneous, uniformly



Figs 1-2. *Capodemus pentameri* spec. nov. 1. Macropter, dorsal. 2. Brachypter, dorsal.

colored throughout; legs bright reddish brown, distal ends of femora and tibiae and entire tarsi yellow; ventral surface nearly uniformly black; abdominal terga 3, 4 and 5 bright orangish mesally, connexiva with very narrow reddish brown lateral margins; lateral pleural pruinosity very much reduced on posterior lobe; head and pronotum coarsely and rugosely punctate, becoming smooth only across posterior margin of pronotum between humeri, thus giving a rather pebbled irregular surface texture; pubescence very short, sericeus, declivit, not upstanding or prominent anywhere on body surface.

Head non-declivit, apex of tylus not reaching distal end of 1st antennal segment, maxillary plate conspicuously visible beyond and laterad of juga when viewed from above, vertex slightly convex, a deep oblique groove present anterior to each ocellus, eyes large, prominent, projecting on short lateral shelf-like extensions outward from head surface, length head 0,65, width 0,80, interocular space 0,53; pronotum almost flat, lateral margins strongly sinuate, tapering from prominent humeral angles to anterior margin, posterior margin deeply concave, postero-lateral area laterad of base of scutellum prominently produced backward in strong lobes, transverse impression obsolete, a rather conspicuous anterior collar-like area present, length pronotum 0,91, width 1,33; scutellum rather convex anteriorly with a moderately prominent raised

median elevation, lateral area on distal $\frac{1}{2}$ depressed, almost excavated, coarsely punctate over entire surface, length scutellum 0,46, width 0,65; hemelytra with membrane mutilated, probably reaching onto basal portion of 7th abdominal tergum, distance apex clavus—apex corium 1,03, apex corium—apex abdomen 2,28; abdomen strongly ovoid, connexivum extremely broad and projecting, sternum 5 strongly narrowed mesally; metathoracic scent gland auricle oval, very slightly bent posteriorly, not strongly acute at apex; fore femora moderately incrassate, armed below on distal $\frac{1}{2}$ with 2 short sharp prominent spines; mesosternum with a deep mesal longitudinal furrow, labium relatively elongate, slightly exceeding mesocoxae, 2nd segment extending between fore coxae, length labial segments I 0,34, II 0,57, III 0,49, IV 0,42; antennae relatively elongate, segments 2 and 3 terete, length antennal segments I 0,22, II 0,57, III 0,49, IV 0,76; total length 5,78.

Holotype: ♀ *Cape Province*; Cape Town, Table Mt. alt. 3,400', 15.x.50 (Loc. No. 10) (Brinck and Rudebeck). In Lund University Museum.

Paratypes: 2 ♂ same data as holotype—2 ♂ Cape Town, 18 Jan. 1919, Ac.-C. 2775—1 ♂ Platte Klipp C. T. (Capetown) 12-10-11. In Lund University; National Collection of Insects, Pretoria; British Museum (Nat. Hist.) and J. A. Slater collections.

This is one of the most distinctive species of *Capodemus*. It may immediately be distinguished from any other species by the presence of two well defined ventral spines on the fore femur. It is also the largest species in the complex, with the antennae and labium relatively elongate and with unusually strongly produced posterior pronotal lobes. The spermatheca (fig. 6) has a distinct flange around the bulb margin, the apex of the gonopore is single and the parameres have distinct "teeth" along the inner margin of the blade.

The two males taken with the holotype are both strongly brachypterous, but slightly less so than are other members of *Capodemus* in that it is possible to discern the suture between the clavus and corium (although the two areas are fused), and a complete membrane remnant is present along the inner margin of the corium. The resulting wing pad is sub-acute, with the apex of the corium pointed and reaching onto the antero-lateral corner of abdominal tergum two. As is generally the situation with brachypterous specimens the pronotum has less broadly produced posterior lobes, and there is a complete irregular groove or transverse impression about $\frac{1}{3}$ of the way from the anterior margin. The paratype from Table Mountain is a macropter but somewhat damaged by dermestids. There are two additional male specimens from Capetown, 18 January 1919, Ac.-C. 2775 not included in the paratype series which are brachypterous and unquestionably conspecific but badly damaged by dermestids.

The holotype locality as given by Brinck & Rudebeck (1955) was the "plateau of the western Table at about 3,400 ft; stony heath with shrubs, at places rather wet ground. In depressions dense ericaceous vegetation and flowering Proteas. Moist ravine with rich plant life and walls and stony ground covered by moss."

Capodemus wilcoxae spec. nov., fig. 7

Macropterous; slender, parallel sided; head, pronotum and scutellum black shining, posterior pronotal lobe across humeri, apex of tylus and posterior end of scutellum red-brown; hemelytra with clavus and corium testaceous yellow, slightly darker along veins and on apical $\frac{1}{3}$ of corium, membrane white, veins unicolorous; abdomen nearly uniformly dark red-brown; antennae uniformly reddish brown; femora castaneous, remainder of legs including distal and proximal ends of femora pale yellow, tibiae

slightly infuscated centrally; lateral prothoracic pruinosity on anterior lobe extending dorsad of longitudinal shining bar onto prothoracic dorsum mesad to level of ocelli, a very narrow shinig area present latperad (= dorsad) of acetabula along posterior prothoracic margin; scutellum with grey pruinose area reaching laterally to distal end with only a narrow mesal stripe shining; all acetabula shining; obscurely punctate on head, more prominently along anterior "collar" area of pronotum, in midline between calli and on posterior lobe; area of calli large, ovoid, polished and glabrous; clothed laterally on pronotum with very short decumbent or semi-erect inconspicuous sericeus hairs.

Head broad, vertex moderately convex, tylus attaining or nearly attaining distal end of 1st antennal segment, length head 0.40, width 0.36, interocular space 0.34; pronotum with lateral margins evenly tapering from humeri to anterior margin, calli prominent and somewhat swollen, anterior collar-like area present, posterior margin shallowly concave, length pronotum 0.63, width 0.86; length scutellum 0.32, width 0.40; hemelytra parallel sided, apex of membrane broadly rounded, extending midway over 7th abdominal tergum, distance apex clavus—apex corium 0.78, apex corium—apex abdomen 1.10; metathoracic scent gland auricle orange, nearly circular, not acuminate; fore femora armed below on distal $\frac{1}{3}$ with a single prominent short acute spine; labium extending well onto mesosternum, not attaining mesocoxae, length labial segments I 0.22, II 0.28, III 0.22, IV 0.24; antennae conventionally terete, length antennal segments I 0.13, II 0.32, III 0.30, IV 0.48; total length 3.54; spermatheca with an elongate pump (fig. 7).

Holotype: ♂ *Cape Province*: Michell's Pass, Ceres 1,500', 16 Oct. 1967 No. 34 (M. H. Sweet). In National Collection of Insects, Pretoria.

Paratypes: 35 ♂, 53 ♀ same data as holotype. In National Collection of Insects, Pretoria; Transvaal Museum; South African Museum, Cape Town; M. H. Sweet and J. A. Slater collections.

The female paratypes differ only in possessing a more elliptical abdomen which is bright red-brown in color and contrasts strongly with the dark lateral areas.

This is a very distinctive species, readily recognizable by its large ovoid glabrous pronotal calli, which are especially prominent in the brachypters and by the narrow shining posterior marginal strip on the propleural surface. Only the holotype and one male paratype are macropterous. In contrast to all other species examined brachyptery is variable in this species, the majority of specimens having very short pale yellow wing pads that are broadly rounded apically and do not extend beyond the posterior margin of the metanotum. A number of specimens have even shorter wings that leave the posterior portion of the metasternum exposed. The most extremely reduced condition is that in which the posterior end of the short wing pad becomes broadly truncate. In a few specimens the pads are longer, tapering distally and reach the antero-lateral area of the second abdominal tergum.

C. wilcoxae resembles *sabulosus* in general habitus, the generally rounded wing pads and in pruinosity pattern. It is readily separable however, by the shining acetabulae, spined fore femora, prominent glabrous calli and the shining posterior propleural marginal area. In this latter feature it is similar to *darwini* (Slater) but the latter has mutic fore femora and a mesosternal furrow.

This species is named for Mrs Darleen B. Wilcox who has made many important contributions to our knowledge of the Blissinae.

***Capodemus stuckenbergi* spec. nov.**

Macropterous; parallel sided; head, pronotum and narrow median elevated area of scutellum black, shining posterior area of pronotum across humeri and apex of tylus red-brown; hemelytra dusky testaceous, infuscated with darker red-brown over most of clavus except distal $\frac{1}{2}$ to $\frac{1}{3}$ laterally, apical $\frac{1}{3}$ of corium and along radial vein to basal $\frac{1}{3}$; membrane opaque white, veins nearly unicolorous; antennae dark fuscous, 1st segment and proximal $\frac{2}{3}$ of segment 2 slightly lighter; legs dull yellowish brown, slightly infuscated; lateral prothoracic pruinosity extending dorsad of shining longitudinal "bar" and onto extreme lateral area of pronotal dorsum, extending completely to posterior margin of propleural area; acetabula pruinose; scutellar pruinosity extending laterally to posterior end; head, pronotum and scutellum conspicuously and rugosely punctate; thickly clothed laterally on pronotum with semi-erect and decumbent sericeous hairs, remainder of dorsum bearing sparse, small scattered hairs.

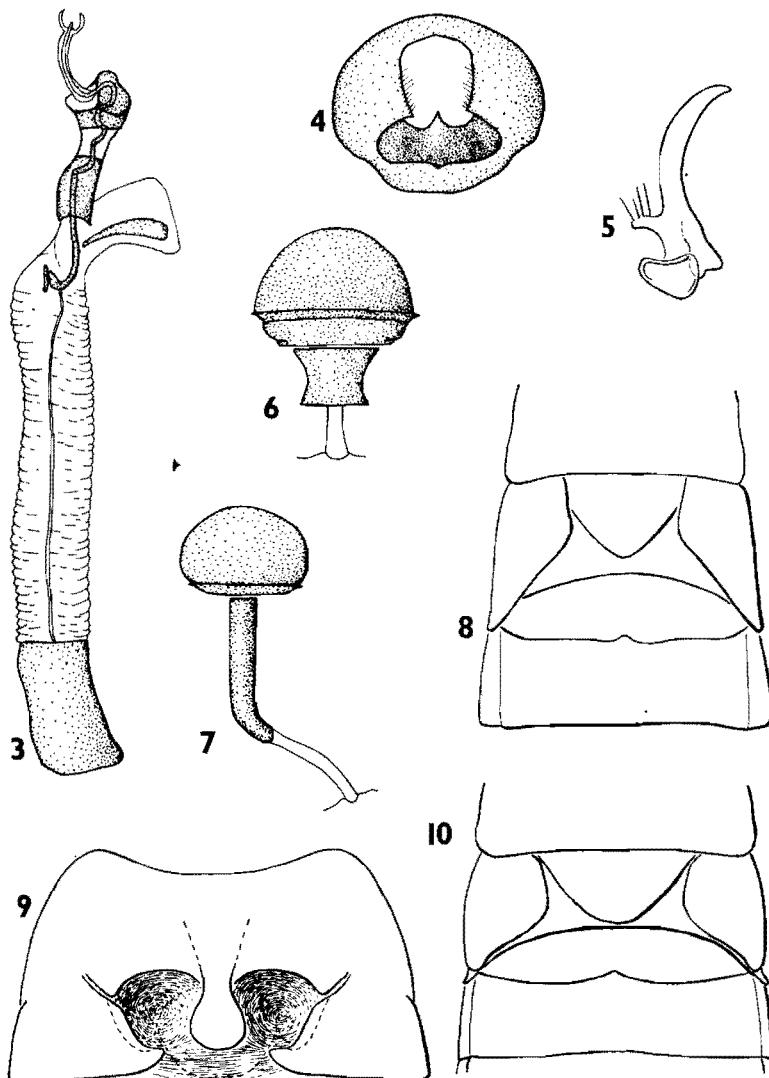
Head non-declivous, eyes large, rounded, strongly produced outward, tylus nearly attaining distal end of 1st antennal segment, vertex slightly convex, length head 0,36, width 0,56, interocular space 0,34; pronotum with lateral margins evenly and strongly tapering from humeral angles to anterior margin, slightly sinuate in area of transverse impression, the latter obsolete mesally, posterior margin shallowly concave, length pronotum 0,62; width 0,84; scutellum with raised shining central elevation reaching well onto basal $\frac{1}{3}$, length scutellum 0,29, width 0,36; hemelytra with lateral corial margins parallel sided, membrane mutilated, but apparently extending at least over anterior $\frac{1}{2}$ of 7th abdominal tergum, distance apex clavus—apex corium 0,70, apex corium—apex abdomen 1,10; metathoracic scent gland auricle oval, slightly curved posteriorly, subacute at distal end; fore femora incrassate, bearing a single relatively stout spine below on distal $\frac{1}{3}$; mesosternum broadly shining, lacking a deep mesal longitudinal furrow, labium extending onto anterior portion of mesosternum, not attaining mesocoxae, length labial segments I 0,22, II 0,24, III 0,19, IV 0,23; antennae conventionally terete, length antennal segments I 0,14, II 0,32, III 0,25, IV 0,46; total length 3,44.

Holotype: ♂ Cape Province: Karreedouw Mountains West of Humansdorp, East Cape Province, 14 Oct., 1959 (B. & P. Stuckenberg). In South African Museum, Cape Town.

Paratype: 1 ♀ same data as holotype. In J. A. Slater collection.

The female paratype is brachypterus. The wing pads are testaceous, and although acuminate barely extend to the antero-lateral corners of the first abdominal tergum. The abdomen is largely bright orange, becoming darker only adjacent to the connexival suture. The scutellum has the pruinosity laterally nearly reaching the distal end, but the central shining area is larger than it is in a number of species where the pruinosity extends to the posterior end, and reaches well onto the anterior half of the scutellum.

This species is closely related to *variabilis*, differing in having the first three antennal segments dark fuscous instead of bright yellow and strongly contrasting with the dark fourth segment, and in the greater development of the pruinosity of the scutellum which reaches or nearly reaches the posterior end of the scutellum in the present species while being confined to the basal area in *variabilis*. Actually this pruinosity pattern is somewhat intermediate as compared with the contrasting patterns of such species as *pentameri* and *sabulosus*. In the two macropters of *variabilis* available for comparison the



Figs 3–10. *Capodemus* species. 3–5. *C. sabulosus* spec. nov. 3. Phallus, lateral. 4. Genital capsule, dorsal. 5. Clasper, lateral. 6. *C. bispinosus* spec. nov., spermatheca. 7. *C. wilcoxae* spec. nov., spermatheca. 8. *C. pentameri* spec. nov., wing pads of brachypter, X50. 9. *C. sabulosus*, fore coxal cavities. 10. The same, wing pads of brachypter, X50.

membranal veins are dark brown and strongly contrasting with the white background color, and the eyes somewhat larger and more ovoid than are those of the holotype of *stuckenbergi*.

***Capodemus variabilis* spec. nov., fig. 11**

Macropterous; body short, stout, nearly parallel sided; head, anterior pronotal lobe and scutellum black shining, distal $\frac{1}{2}$ of tylus and greater portion of posterior pronotal lobe strongly contrasting orange yellow; hemelytra with anterior $\frac{1}{2}$ of clavus, corium laterad of radius and entire apical $\frac{1}{4}$ smoky grey brown; membrane white, clouded on distal $\frac{1}{2}$ and adjacent to distal end of apical corial margin with dusky brown, veins unicolorous; antennae with segments 1, 2 and 3 yellowish, 4th segment contrastingly dark brown; femora and proximal $\frac{1}{2}$ of tibiae brown, proximal and distal ends of femora and remainder of legs yellow; abdomen including connexiva uniformly dark castaneous; prothoracic pruinosity complete laterally, reaching posterior margin of propleural area, extending dorsad on anterior lobe well above transverse shining stripe, almost to level of ocelli (fig. 11); all acetabula shining; scutellar pruinosity confined to extreme anterior portion mesally and laterally to anterior $\frac{1}{2}$; clothed above with prominent, conspicuous, rather elongate upstanding sericeus hairs including area of calli; conspicuously but non-rugosely punctate.

Eyes produced on very short shelf-like head extensions, vertex moderately convex, tylus attaining distal end of 1st antennal segment, length head 0,38, width 0,50, interocular space 0,32; pronotum evenly narrowing from humeri to anterior margin, transverse impression obsolete mesally, posterior margin straight before scutellum with well developed posteriorly developed lobes laterally, anterior margin with well developed "collar", length pronotum 0,54, width 0,80; length scutellum 0,28, width 0,36; hemelytra with lateral corial margin sinuate, gently expanded posterior to level of distal $\frac{1}{3}$ of claval commissure, membrane broadly rounded, reaching posterior $\frac{1}{2}$ of abdominal tergum 7, distance apex clavus—apex corium 0,64, apex corium—apex abdomen 0,88; metathoracic scent gland auricle ovoid, curved posteriorly, acute at distal end; fore femora armed with a single small spine below on distal $\frac{1}{3}$; mesosternum lacking a deep median longitudinal furrow; labium extending onto mesosternum, not attaining mesocoxae, length labial segments I 0,20, II 0,20, III 0,16, IV 0,20; length antennal segments I 0,12, II 0,24, III 0,22, IV 0,40; total length 2,96.

Holotype: ♂ Cape Province: Brackenhill Falls, 6 mi. E. Knysna, 11 Feb. 1968 (T. Schuh, J. A. Slater and M. Sweet), adults and nymphs on *Ehrhartia* sp. In National Collection of Insects, Pretoria.

Paratypes: 18 ♂, 9 ♀ same data as holotype. In National Collection of Insects, Pretoria; Transvaal Museum; South African Museum, Cape Town; M. H. Sweet and J. A. Slater collections.

The paratype series consists of six male and four female macropters, the remaining specimens being brachypterous. In the latter the wing pads are short, but acute distally and extend only onto the extreme antero-lateral corners of abdominal tergum one. The wing pads are usually light testaceous, but in several specimens strongly suffused with smoky gray. The abdominal tergum varies from nearly uniformly dark red brown to bright orange. The labium generally reaches the mesocoxae and the posterior pronotal lobe is reduced as is generally the case with brachypters of this genus.

There is considerable variation in antennal color in the type series; generally segments one, two and three are yellow as in the type and contrast strongly with the dark fourth segment. However, some individuals have the first three segments reddish brown. A similar but less marked variation is present in leg coloration as well.

In addition to the type series discussed above there is material that we discuss briefly as "populations" I, II, III and IV which will key here and which either represent variations of this species or one or more closely related species. The solution of the status of these populations, however, will require study of good series from many localities as there are small morphological differences present. More important perhaps is the fact that several of these populations were taken on very different host plants. However, where we have had nymphs as well as adults for comparison, no differences that we feel to be significant are present.

***Capodemus tenuatus* spec. nov.**

Brachypterous; very elongate and slender, parallel sided; coloration predominantly black shining, wing pads testaceous, infuscated with gray basally; antennal segments 1 and 2 dull yellowish brown, 3 infuscated and dark castaneous, 4 black; legs, posterior marginal area of pronotum and abdominal connexivum yellowish brown, mesal area of femora infuscated with darker brown; lateral prothoracic pruinosity reaching but not extending dorsad of lateral shining black bar, thus not extending onto lateral areas of dorsal surface of pronotum, acetabula shining; scutellar pruinosity restricted to anterior $\frac{1}{2}$ to $\frac{1}{3}$; clothed above with very short inconspicuous sericeus hairs intermixed laterally on pronotum and wing pads with a few short upstanding hairs.

Head large, nearly as broad across eyes as maximum pronotal width, eyes small, sessile, tylus nearly attaining distal end of 1st antennal segment, length head 0,38, width 0,50, interocular space 0,33; pronotum slender, lateral margins parallel sided to area of calli which are large, ovoid, nearly glabrous and smooth, posterior margin of pronotum shallowly concave, transverse impression shallow but complete, length pronotum 0,46, width 0,63; scutellum tumid, rugose and coarsely punctate, length scutellum 0,24, width 0,36; wing pads acuminate, attaining or nearly attaining antero-lateral margins of 1st abdominal tergum, length wing pads 0,31; abdomen slender, linear, length abdomen 2,08; metathoracic scent gland auricle broadly oval, acuminate distally; mesosternum lacking a median longitudinal furrow; fore femora armed below with a single small inconspicuous spine; labium elongate, extending well between mesocoxae, 2nd segment barely attaining fore coxae, length labial segments I 0,26, II 0,34, III 0,26, IV 0,24; antennae conventionally terete, length antennal segments I 0,12, II 0,32, III 0,28, IV 0,26; total length 3,22.

Holotype: ♂ Cape Province: Muizenberg Mt., Cape Peninsula, loc. 107, 950', 9 Dec. 1967 (M. H. Sweet). In National Collection of Insects, Pretoria.

Paratype: 1 ♂ same data as holotype. In J. A. Slater collection.

This is a very distinctive species within the genus, easily recognizable by its elongate slender body shape, lack of prothoracic pruinosity dorsad of the shining lateral bar, scutellar pruinosity confined to the anterior area, and spined fore femora.

***Capodemus sabulosus* spec. nov., figs 3-5, 9, 10, 17**

Macropterus; body robust, stocky, nearly parallel sided; head, anterior pronotal lobe and scutellum black, strongly shining, posterior pronotal lobe across humeri and apical $\frac{1}{2}$ of tylus a contrasting bright red-brown; hemelytra with clavus largely smoky brown, becoming testaceous on distal $\frac{1}{2}$, corium largely yellow-testaceous, apical margin, cubital and radial veins darker brown, entire area of corium laterad of

radial vein and on distal $\frac{1}{3}$ darker yellowish brown, membrane white, becoming somewhat smoky gray on distal $\frac{1}{3}$, veins pale except in distal area where dark brown; legs uniformly bright yellowish brown; antennae with first 3 segments yellowish brown, 4th segment dark fuscous; prothoracic pruinosity complete on pleuron, extending onto dorsal surface of anterior pronotal lobe along lateral $\frac{1}{3}$ to level of ocelli; scutellum pruinose to posterior end but with a median shining elevated ridge on posterior $\frac{1}{2}$; all acetabula pruinose; dorsal surface rather prominently and evenly punctate throughout; clothed above laterally on anterior pronotal lobe and lateral areas of corium with prominent upstanding and semi-decumbent sericeous hairs, area across humeri on posterior pronotal lobe nearly glabrous.

Head non-declivous, tylus extending onto distal $\frac{1}{3}$, sometimes nearly to distal end of 1st antennal segment, eyes large, occupying most of lateral head surface and strongly ovoid (fig. 17), length head 0,38, width 0,58, interocular space 0,36; pronotum relatively short and broad, transverse impression obsolete mesally, lateral margins sinuate, rather evenly convexly narrowing from humeral angles to anterior margin, posterior margin very shallowly concave, length pronotum 0,64, width 0,96; length scutellum 0,34, width 0,48; hemelytra with lateral corial margins somewhat expanded opposite level of anterior end of claval commissure, membrane broadly rounded, reaching almost to apex of abdomen, well over 7th abdominal tergum, distance apex clavus—apex corium 0,76, apex corium—apex abdomen 1,08; metathoracic scent gland auricle ovoid, slightly acuminate at distal end; fore femora moderately incrassate, mutic; labium extending onto extreme anterior margin of mesosternum, remote from mesocoxae, mesosternum lacking a deep median longitudinal furrow; length labial segments I 0,22, II 0,24, III 0,18, IV 0,22; antennae slender, terete, 4th segment narrowly fusiform, length antennal segments I 0,14, II 0,32, III 0,30, IV 0,50; total length 3,52.

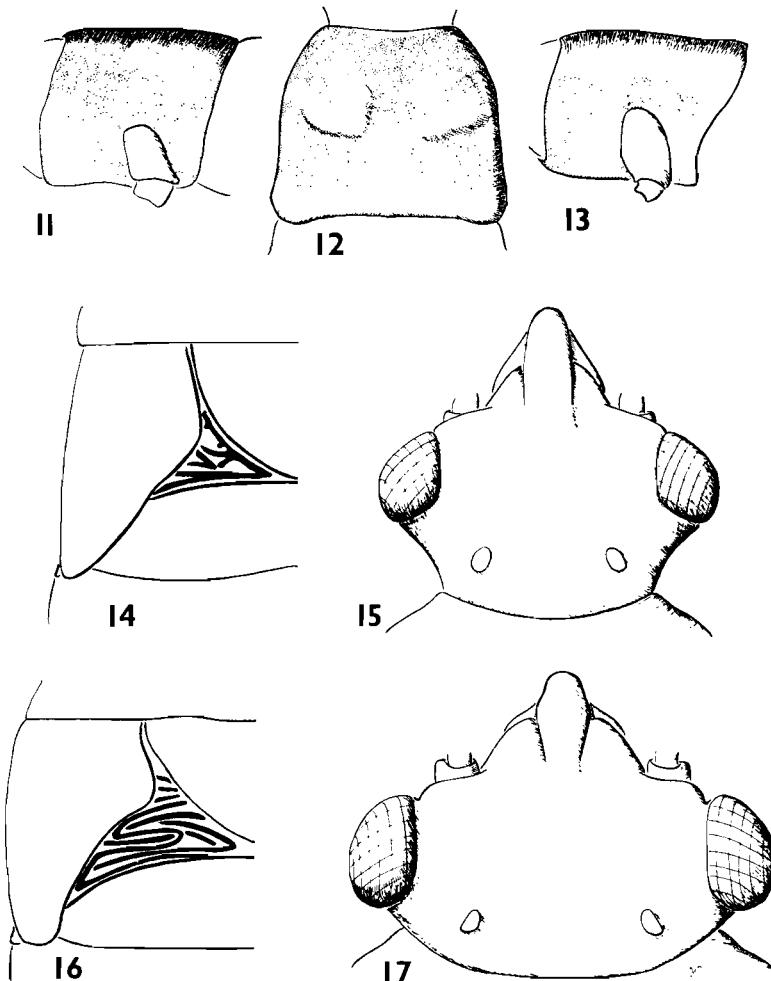
Holotype: ♂ *Cape Province*: Muizenberg Beach, Cape Town, 23 Jan. 1968, (J. A. and S. Slater, T. Schuh and M. H. Sweet) adults and nymphs on *Ammophila arenaria* Link and *Ehrharta villosa* Schult. In National Collection of Insects, Pretoria.

Paratypes: 53 ♂, 43 ♀ same data as holotype; 58 ♂, 22 ♀ Muizenberg Beach, Cape Peninsula, 30 September 1967 (M. H. Sweet No. 20). In National Collection of Insects, Pretoria; Transvaal Museum; South African Museum, Cape Town; J. A. Slater and M. H. Sweet collections.

This species is very closely related to *C. distinctus* and *herbosus*, all of which appear to be associated with beach habitats. It may be distinguished from *herbosus* in the brachypterous condition by the short rounded wing pads that do not extend much beyond the posterior margin of abdominal segment one. From *distinctus* to which it is most closely related the width of the head differs and is expressed by the much larger more protrudent eyes in the present species (figs 15, 17).

Of the type series 109 of 112 males and 58 of 65 females are brachypterous.

Brachypters differ from the macropterous male holotype described above in having the posterior pronotal lobe reduced and the pronotum thus more quadrate in appearance. The scutellum is almost entirely gray pruinose with only a small median oval shining spot which generally does not reach the posterior margin. The wings are reduced to very tiny short lobate pads which in most specimens do not attain even the antero-lateral corners of abdominal tergum one, although occasionally they may reach this area. The labium nearly attains or does attain the mesocoxae. The abdomen in these brachypters is generally a bright red-brown mesally, becoming dark piceus laterad with the abdominal connexivum bright red-brown.



Figs 11–17. *Capodemus* species. 11. *C. variabilis* spec. nov., pronotum, lateral X50. 12. *C. elegiae* spec. nov., pronotum, dorsal X50. 13. *C. pentameri* spec. nov., pronotum, lateral X50. 14. *C. rusticoides* spec. nov., metanotal ridges X75. 15. *C. distinctus* spec. nov., head, dorsal X100. 16. *Capodemus* sp. near *rusticus*, population IX, metanotal ridges X75. 17. *C. sabulosus* spec. nov., head, dorsal X100.

There is some minor variation in the series; the first three antennal segments are frequently yellow and contrast strikingly with the dark fourth segment; in some specimens the femora become somewhat infuscated. The series generally is surprisingly uniform in both color and structural characteristics.

We have also examined ten males and eight females from Hout Bay, Cape Peninsula (all brachypterous) which we believe to be conspecific. In this series the

first three antennal segments are light yellow. The anterior pronotal margin as well as the pronotum across the humeral angles tends to be yellow rather than reddish brown. The nymphs also possess a more strongly developed pinkish caste on the abdomen than do those of the Muizenberg Beach series. However, these specimens were taken on the same host species and share all of the other features that distinguish *sabulosus* from related species so that although there may be evidence of some reduction in gene flow between these two populations, we believe they should be considered as conspecific.

***Capodemus darwini* (Slater), comb. nov.**

Ischnodemus darwini Slater, 1964, *S. Afr. Animal Life* 10: 116–117.

This species is closely related to *sabulosus*, *elegiae* and *herbosus*, agreeing in the possession of mutic fore femora, prothoracic pruinosity that extends onto the dorsal surface laterally and thus well above the shining “bar” near the dorsal margin of the propleural area, pruinosity anteriorly on the pronotum reaching mesad of the level of the ocelli and scutellar pruinosity extending to or nearly to the posterior end. It also agrees with *elegiae* in having pruinosity well developed mesally on the transverse impression of the pronotum. In general habitus it closely resembles *sabulosus*. However, *darwini* is distinct from any of the above species in having the posterior portion of the propleural area non-pruinose, shining almost to the ventral margin, and in the possession of a well developed longitudinal furrow mesally on the mesosternum. Actually *darwini* may be most closely related to *wilcoxae* which also has a shining stripe posteriorly on the propleural area but which has a prominent spine on the fore femur. The fore femoral spine does vary in some species of Blissinae, but *wilcoxae* does not have a deep mesosternal furrow which the original description says is present in *darwini*. Obviously the status of this species requires further study.

***Capodemus elegiae* spec. nov., fig. 12**

Brachypterous; body short, stout, robust; general coloration dark, nearly uniformly black; abdomen uniformly very dark red-brown; pronotum posteriorly between humeri narrowly and apex of tylus reddish brown; legs bright yellowish brown, becoming darker rich red-brown on femora and on proximal $\frac{2}{3}$ of tibiae; antennae reddish brown; prothoracic pruinosity complete on lateral surface, extensively developed on dorsal surface, reaching midline broadly anterior to calli and nearly attaining midline in a mesally tapering stripe in area of transverse impression behind calli, leaving shining areas only on calli, mesally behind calli, and on entire posterior lobe (fig. 12); scutellar pruinosity reaching posterior end laterad, leaving only a narrow median shining stripe on posterior $\frac{1}{2}$; all acetabula pruinose; head, pronotum and scutellum punctate, rugosely so on posterior pronotal lobe and coarsely on scutellum; dorsal vestiture short, inconspicuous and decumbent.

Head elongate, acuminate, apex of tylus exceeding distal end of 1st antennal segment, vertex convex, eyes ovoid, set on short lateral head extensions, length head 0,38, width 0,44, interocular space 0,28; pronotum short, subquadrate, posterior margin nearly straight, lateral margins slightly narrowing from humeral angles to calli, transverse impression complete but shallow, length pronotum 0,36, width 0,60; length scutellum 0,16, width 0,32; wing pads acuminate, reaching or nearly reaching antero-lateral angles of abdominal tergum 2, (fig. 8) length wing pad 0,30, abdomen relatively

short and broad, length abdomen 1,62; metathoracic scent gland auricle ovoid, not tapering distally, slightly curving posteriorly; fore femora mutic; mesosternum rugulose with a diffuse small median black area, lacking a deep median furrow; labium extending onto mesosternum well between mesocoxae, length labial segments I 0,20, II 0,22, III 0,17, IV 0,19; antennae stout, conventionally terete, length antennal segments I 0,08, II 0,22, III 0,18, IV 0,32; total length 2,58.

Holotype: ♂ Cape Province: 4 mi. W. Gydo Pass Summit, N. Ceres, 26 Jan. 1968, on *Elegia parviflora* Kunth. (T. Schuh, J. A. and S. Slater, M. H. Sweet). In National Collection of Insects, Pretoria.

Paratypes: 2 ♂ same data as holotype. In J. A. Slater and M. H. Sweet collections.

This is a very short stout blackish species, easily recognizable by the extensive development of the dorsal prothoracic pruinosity that is broadly developed across the anterior "collar" area and across the area of the transverse impression, by the elongate head that exceeds the first antennal segment, the strongly convex head vertex, and the short broad pronotum.

The two paratypes differ from the holotype described above in not having the pronotal pruinosity contiguous anteriorly and less extensively extended mesad across the transverse impression. The pruinosity pattern is, however, of the same type and the specimens are almost identical in all other characteristics.

The nymphs of this species, as will be discussed in a later publication, are also distinctive in that the sclerotized posterior abdominal plates are extensively bordered with black.

***Capodemus herbosus* spec. nov.**

Brachypterous: general size, shape and coloration as in *C. sabulosus*; head, pronotum, scutellum and abdomen black, shining, posterior margin of pronotum and tylus contrastingly bright red-brown; wing pads sooty gray testaceous; legs uniformly brownish yellow; first 3 antennal segments dull yellowish, 4th a strongly contrasting dark fuscous; head, pronotum and scutellum conspicuously punctate; lateral prothoracic pruinosity complete laterally, extending onto anterior pronotal lobe dorsally over lateral $\frac{1}{3}$ of pronotal surface; all acetabula pruinose; scutellum pruinose to posterior end with an ovoid shining central spot; clothed with conspicuous semi-decumbent sericeus hairs, these particularly long and subtomentose on abdomen.

Head non-declivent, tylus attaining or nearly attaining distal end of 1st antennal segment, head moderately convex, eyes large, rounded, prominently ovoid (fig. 17), length head 0,36, width 0,60, interocular space 0,38; pronotum with lateral margins nearly straight from humeral angles to calli, then arcuately narrowing to anterior margin, posterior margin nearly straight, length pronotum 0,50, width 0,76; length scutellum 0,22, width 0,40; wing pads elongate and pointed, acuminate, reaching to antero-lateral margins of 2nd abdominal tergum, length wing pads 0,42; abdomen nearly parallel sided, length abdomen 2,12; metathoracic scent gland auricle ovoid, slightly acuminate distally; fore femora incrassate, mutic; labium extending well onto mesosternum, reaching or nearly reaching mesocoxae, length labial segments I 0,24, II 0,24, III 0,22, IV 0,24; antennae terete, 4th segment narrowly fusiform, length antennal segments I 0,14, II 0,32, III 0,31, IV 0,48; total length 3,28.

Holotype: ♂ *Cape Province*: Keurbooms River, 12 Feb. 1968, adults on *Eragrostis curvula* (Schrad) Nees (T. Schuh, J. A. and S. Slater, M. Sweet). In National Collection of Insects, Pretoria.

Paratypes: 12 ♂, 10 ♀ same data as holotype except 11 Feb. 1968. In National Collection of Insects, Pretoria; Transvaal Museum; South African Museum, Cape Town; J. A. Slater and M. H. Sweet collections. The entire type series is brachypterous.

This species is very closely related to *C. sabulosus* and *C. distinctus* differing from *sabulosus* primarily in the acuminate tapering wing pads. The wing pads are dark grayish in this species and usually bright yellow in *sabulosus*. The eyes are large and ovoid, similar to those of *sabulosus* (fig. 17) in contrast to the small eyes of *distinctus* (fig. 15).

***Capodemus distinctus* spec. nov., fig. 15**

Brachypterous: shape and general color as in *sabulosus* head, pronotum and scutellum black, posterior pronotal lobe and tylus bright red-brown to yellowish; wing pads pale testaceous; abdomen bright orange-yellow with connexivum yellowish; legs uniformly yellow; antennae sordid yellowish brown, 4th segment fuscous; pronotal pruinosity extending dorsally over lateral $\frac{1}{2}$ to $\frac{1}{4}$ of dorsal surface of anterior lobe; posterior lobe of propleural area and all acetabula pruinose, scutellum pruinose nearly to posterior end with a large black median shining spot; dorsal surface evenly and rather conspicuously punctate; abdomen and wing pads with decumbent to suberect prominent sericeus hairs.

Head non-declivous, apex of tylus reaching distal end of 1st antennal segment, vertex moderately convex, eyes small, not strongly protrudent, but set on distinctly shelf-like head extensions (fig. 15), length head 0,42, width 0,58, interocular space 0,38; pronotum with transverse impression present but shallow, posterior margin nearly straight, lateral margins not tapering mesad from humeral angles to anterior portion of calli, then arcuately narrowing to anterior margin, length pronotum 0,52, width 0,82; length scutellum 0,30, width 0,44; mesothoracic wing pads acuminate distally, extending to antero-lateral angles of 2nd abdominal tergum, length wing pads 0,50, length abdomen 2,66; metathoracic scent gland auricle ovoid, slightly angled posteriorly, subacuminate at apex; mesosternum concave, but not deeply longitudinally furrowed; fore femora moderately incrassate, mutic; labium extending well onto mesosternum, nearly reaching anterior margin of mesocoxae, length labial segments I 0,28, II 0,28, III 0,26, IV 0,24; antennae slender, terete, segment 4 narrowly fusiform, length antennal segments I 0,14, II 0,32, III 0,28, IV 0,54; total length 3,94.

Holotype: ♀ *Cape Province*: Pearly Beach, Bredasdorp, "S.A.M. 9.59." In South African Museum, Cape Town.

This species is very closely related to *C. sabulosus*, agreeing with it in general body shape, coloration, length of labium, development of thoracic and scutellar pruinosity, and differing only very slightly in the shape of the scent gland orifice. It may appear presumptuous in such a difficult complex to describe this species on the basis of a single specimen. However, the characteristics of this specimen, as compared to the long series of *sabulosus* that we have available for study, seems to preclude the likelihood that we are dealing with a single species. In particular the eye shape of the present species is very different from that of *sabulosus* (figs 15, 17). Furthermore the wing pads in the brachypterous holotype are of the acuminate rather than the rounded lobe type, and

we have found this character to be important in all of the populations of this genus that we have examined. It seems justifiable to consider this specimen as representing a distinct species.

***Capodemus pentameri* spec. nov., figs 1, 2, 8, 13**

Macropterous: head and pronotum black, subshining, the latter becoming red-brown posteriorly across humeri, scutellum largely black, shining, pruinose anteriorly only, slightly more extensively developed in antero-lateral area; hemelytra colored much as in *bispinosus*, post cubital vein of clavus not darkened on distal $\frac{1}{3}$, distal $\frac{1}{3}$ of corium less intensely darkened, becoming red-brown along lateral marginal areas, membrane strongly infuscated with smoky brown, the veins very noticeably dark, extreme base and a narrow suffuse central stripe not attaining apical margin pale white; antennae nearly uniformly dark red-brown; central area of all femora and tibiae bright red-brown, becoming shining yellow on trochanters, distal end of femora, proximal and distal ends of tibiae and all of tarsi; lateral prothoracic pruinosity reduced, not extending dorsad of the longitudinal lateral shining bar, extending posteriorly behind coxa to midline narrowly, but posterior lobe of propleuron completely non-pruinose and shining, this shining area becoming progressively broader from prosternal plate to humeri (fig. 13); all acetabula shining, head and pronotum nearly uniformly evenly non-rugosely punctate, narrowly smooth and glabrous across posterior margin between humeri; scutellar punctures large, coarse and deep; clothed above with moderately elongate silky decumbent or semi-decumbent hairs.

Head non-declivit, apex of tylus attaining or nearly attaining distal end of 1st antennal segment, vertex only slightly convex, eyes large, rounded, set slightly away from antero-lateral pronotal angles, but not strongly produced on lateral head extensions, length head 0,46, width 0,61, interocular space 0,38; pronotum evenly narrowing from humeri to anterior margin, lateral margins slightly sinuate, posterior margin shallowly concave with only moderately produced caudo-lateral lobes, transverse impression complete, very shallow, area of calli granulose, impunctate, pubescent, length pronotum 0,99, width 0,49; scutellum with a prominent median elevation, rather deeply depressed laterally, length scutellum 0,42, width 0,49; hemelytra with lateral margins nearly straight, membrane broadly rounded, reaching midway onto 7th abdominal tergum, distance apex clavus—apex corium 0,91, apex corium—apex abdomen 1,22; metathoracic scent gland auricle broadly ovoid, slightly curved posteriorly, subacute at distal end; fore femora moderately incrassate, mutic; mesosternum nearly flat, lacking a distinct median longitudinal furrow; labium extending midway over mesosternum, not attaining mesocoxae, length labial segments I 0,27, II 0,30, III 0,27, IV 0,27; antennae relatively short, terete, length antennal segments I 0,15, II 0,34, III 0,30, IV 0,49; total length 4,14.

Holotype: ♂ *Cape Province*: just S. Outeniqua Pass Summit, S. of Oudtshoorn, 7 Feb. 1968, adults and nymphs on *Pentameris thuarii* Beauv. (T. Schuh, J. A. & S. Slater, M. Sweet). In National Collection of Insects, Pretoria.

Paratypes: 122 ♂, 72 ♀ same data as holotype. In National Collection of Insects, Pretoria; Transvaal Museum; South African Museum, Cape Town; M. H. Sweet and J. A. Slater collections.

The type series consists of 120 brachypters and 75 macropters. Of these macropters 45 are males and 30 females. The brachypters have the usual reduction in the width and length of the posterior pronotal lobe so that the lateral pronotal margins are only very slightly narrowed until anterior to the maximum width of the calli. The wing pads of the brachypters are subacutely pointed (fig. 8), reaching barely to the antero-lateral margin of abdominal tergum two. There is a very tiny membrane remnant present, at least on the distal half of the apical corial margin. These brachypters usually have the labium extending to or even between the mesocoxae, in contrast to the macropters where the apex of the labium does not attain the mesocoxae.

There is some variation, particularly in color, in the long type series before us. The legs are frequently nearly uniformly red-brown. Less frequently the middle and hind legs are nearly uniformly yellow, and in an occasional specimen all of the legs are yellow. While the antennae are never bright yellow in color, frequently the first three antennal segments are lighter brown than the very dark fourth segment. In the brachypters the central area of the abdominal tergum is usually a bright red-brown and strongly contrasting with the dark lateral areas and the dark connexivum. This abdominal coloration is extremely variable, particularly in the males. The abdominal tergum may be completely black, or with an extremely tiny red-brown area. Frequently the amount of light reddish brown color on the abdomen is correlated with the development of red-brown color on the posterior lobe of the pronotum which may cover almost the entire posterior lobe, be reduced to a tiny marginal posterior strip, or be entirely lacking. In the latter case the insects appear almost black dorsally. In the macropters there is also variation in the color of the hemelytra, in that occasionally they are quite light, but frequently more extensively darkened than is the holotype. In some specimens the membrane is almost uniformly black with pale areas only at the base and as a very small central spot lying beyond the middle of the membrane. Occasionally in this darkened condition there will be small light areas adjacent to the apex of the corium and along the apical corial margin midway from the inner angle to the apex. In all cases, however, the membrane veins are dark. In darker specimens there may be more extensive development of the dark distal third of the corium and its attendant anteriorly directed stripe along the radial vein, in which case the corial coloration resembles that of *bispinosus* very closely. In many specimens the scent gland orifice is more pointed at the distal end than in the holotype, and in one specimen it assumes a rather elliptical appearance. However, the important structural features are surprisingly constant in this large series. The variation noted above in this long series has been important in our decision to retain as single species several other series that are separable only by similar character complexes.

This is a very distinctive species, agreeing with *bispinosus* from Cape Town and *tenuatus* from Muizenberg Mt., 950', in being the only species of *Capodemus* that have the lateral prothoracic pruinosity confined to an area below the black longitudinal shining bar near the upper lateral margin, and in having the posterior portion of the propleural area (prothoracic area laterally) completely shining to the prosternal plate (fig. 13). It differs from these two species in lacking a fore femoral spine. From *bispinosus* which it resembles in general size and appearance it may also be recognized by the much shorter antennae, the less elongate labium, the lack of shelf-like extensions upon which the eyes are set, the longer and more silky thoracic hairs and the much less coarsely punctate thoracic and head surface. The lateral pronotal margins of the macropters of this species are also much less strongly sinuate than they are in *bispinosus*.

***Capodemus hirsutus* spec. nov.**

Blissus rusticus Slater, 1964, (*nec* Stål), *S. Afr. Animal Life* 10: 97 (pt.).

Brachypterous: elongate-elliptical; head, and anterior pronotal lobe black to very dark brown, tylus, posterior pronotal lobe and scutellum reddish brown; abdomen much lighter red brown, connexiva paler; wing pads infuscated with smoky gray; antennae light yellowish testaceous, legs dull yellow; prothoracic pruinosity complete on posterior lobe of propleuron, extending onto dorsal surface well above shining lateral bar and extending along transverse impression to well mesad of inner margin of eye; scutellar pruinosity confined to anterior $\frac{1}{3}$; mid and hind acetabula shining except at extreme distal margin; head and pronotum coarsely and closely punctate; head, prosternum including calli, scutellum, legs, antennae and wing pads densely clothed with elongate upstanding almost woolly sericeous hairs.

Head broad, tylus attaining or slightly exceeding distal end of 1st antennal segment, vertex strongly convex, length head 0,54, width 0,76, interocular space 0,44; pronotum with well developed anterior "collar", transverse impression deep and complete, posterior margin nearly straight, length pronotum 0,58, width pronotum 0,94; scutellum strongly convex, with a prominent, complete smooth shining median elevation, length scutellum 0,26, width scutellum 0,52; wing pads distally acuminate, barely attaining antero-lateral angles of abdominal tergum 2, length wing pads 0,50; length abdomen 3,12; scent gland auricles red-brown, sharply acute at distal end; mesosternum slightly excavated, without a deep median longitudinal furrow; fore femora mutic; labium attaining mesocoxae, length labial segments I 0,27, II 0,30, III 0,26, IV 0,26; length antennal segments I 0,14, II 0,40, III 0,36, IV 0,42 (paratype); total length 4,60.

Holotype: ♀ *Cape Province*: Skurwebergen, E. of Citrusdal, Feb. 1928 (H. H. Barnard). In South African Museum, Capetown.

Paratype: 1 ♀ (brachypterous) same data as holotype. In J. A. Slater collection. The types were reported by Slater (1964) as *Blissus rusticus* from Skurteberge (*sic*).

The paratype has the anterior and posterior pronotal margins, the wing pads and legs light yellow and the antennae paler than in the holotype. The pruinosity is less well developed in the transverse impression and the abdomen is a lighter orangish color.

This species is related to *rusticus* and *rusticoides* by virtue of the reduced scutellar pruinosity, mutic fore femora and general pronotal pruinosity, but is readily distinguishable by the dense elongate dorsal vestiture, prolongation of the pruinosity in the pronotal transverse impression, shining middle and posterior acetabula and strongly acute scent gland auricle.

***Capodemus rusticoides* spec. nov., fig. 14**

Macropterous: very similar to *rusticus*; head, pronotum and scutellum black, pronotum red-brown across humeri; hemelytra infuscated on anterior $\frac{1}{2}$ of clavus, apical $\frac{1}{3}$ of corium dark chocolate brown, extending to base laterad of radial vein; membrane pale, somewhat infuscated over much of mesal portion of surface; first 3 antennal segments reddish brown, 4th segment black; legs reddish brown; abdomen dark chocolate brown with only narrow lateral margins of connexivum reddish brown; pruinosity and punctures as in *rusticus*.

Head almost attaining distal end of 1st antennal segment, length head 0,41, width 0,62, interocular space 0,39; pronotum with a weak anterior collar, lateral margins evenly narrowing from humeral angles, posterior margin straight before scutellum with well developed lateral lobes; length pronotum 0,66, width 1,0, length scutellum 0,32, width 0,50; distance apex clavus—apex corium 0,74, apex corium—apex abdomen 1,20; membrane broadly rounded apically, extending over basal $\frac{1}{2}$ of 7th abdominal tergum; scent gland auricle sub-acute distally; fore femora mutic; mesosternum broadly shining, lacking a deep median longitudinal groove, labium extending well onto mesosternum; length labial segments I 0,24, II 0,29, III 0,21, IV 0,22; length antennal segments I 0,12, II 0,30, III 0,28, IV 0,50; total length 3,7.

Holotype: ♂ *Cape Province*: Michell's Pass Summit, SW of Ceres 25 Jan. 1968 (T. Schuh, J. A. and S. Slater, M. Sweet). In National Collection of Insects, Pretoria.

Paratype: 1 ♀ (brachypterous) same data as holotype. In J. A. Slater collection.

The brachypter is very similar to *rusticus*, differing chiefly by the characters given in the preceding key. It differs from most of the specimens that we have assigned to *rusticus* in possessing a very narrow marginal pale area on the connexivum.

Adults of this species are extremely similar to those of *rusticus*. They agree in possessing prothoracic pruinosity that extends dorsad of the black longitudinal bar, lacking spines on the fore femora and having the scutellar pruinosity confined to the basal area except narrowly along the extreme lateral margin. The legs of *rusticus* are generally slightly lighter yellowish or yellow brown and the few individuals available for study run smaller than do those of the present species, but only slightly and probably not significantly so.

Capodemus rusticus (Stål), comb. nov.

Blissus rusticus Stål, 1865 *Hem. Afr.* 2: 123

This represents the most difficult area in the entire genus. There is a considerable amount of variation present in specimens from different localities that will run in our key to *rusticus*. It is entirely possible that several distinct species are represented, but the number of specimens is so limited that we believe it preferable merely to point out the differences under our "population" section for future evaluation when more adequate series including macropters and nymphs are available for study.

The lectotype specimen is a female collected by J. Wahlberg from "Cap. B. Spei" without definite locality. This specimen possesses pronotal pruinosity that extends onto the dorso-lateral surface reaching anteriorly as far mesad as a line running backward from the ocelli. The scutellar pruinosity covers the anterior one-third and extends laterad posterior to the caudal third but leaves the central area shining posteriorly. The forewings of brachypters are acuminate, only reaching the posterior margin of tergum one with a conspicuous "claval lobe" along the inner margin of the "pad" and the surface is infuscated. The abdominal sternum is dark chocolate brown and contrasts strongly with the ochraceous connexivum. The labium extends between the mesocoxae; all acetabula are completely pruinose. The mesosternum is strongly shining and not deeply mesally furrowed. The antennae are nearly uniformly reddish brown, with segments two and three slightly paler with the distal ends darkened; the legs uniformly dull yellow. Antennal segment two is noticeably longer than segment three. The metanotum has a sharply margined U-shaped ridge and the rugosity is coarse with three

to four regulae present. The pronotum is moderately convex and longer than the length of the fourth antennal segment. Other descriptive features are given in Slater (1964). The allotype and one female paratype agree with the lectotype in all essential features. The specimens reported by Slater (1964) as *rusticus* from Tzitzikama forest and Skurteberge (*sic*) near Citrusdal are here referred to *C. hirsutus*.

Capodemus rostratus (Slater), comb. nov.

Blissus rostratus Slater, 1964, *S. Afr. Animal Life* 10: 97-98.

This species was originally described from a macropterous male and a brachypterous female intercepted at a New York, U.S.A. plant quarantine station. We have not re-examined the type series nor seen additional material, and thus cannot determine the pronotal and scutellar pruinosity pattern. The species is very distinctive in possessing an extremely elongate labium that extends posteriorly to the base of the abdomen. The fore femora are spined and the wing pads of the brachypter are said to be acuminate and not attaining the first abdominal tergum.

UNASSIGNED POPULATIONS

The following material is listed here to point out the relationships with species described above. Most of the material listed consists of very short series. In some cases we feel that distinct species or subspecies will eventually be established. In other cases these populations will probably prove to represent variations of described species.

POPULATION I: Two brachypterous males from Knysna Head, Feb. 9, 1968 (T. Schuh, J. A. Slater & M. Sweet), taken on *Thamnochortus sporadicus* Pillans.

These specimens will run in our key to *C. variabilis*. It is a small dark mottled form with the suture between abdominal terga four and five virtually straight and the length of the pronotum, fourth antennal segment and the seventh abdominal tergum subequal. The wing pads are dark mottled and the second antennal segment is longer than the third.

POPULATION II: A male and a female brachypter from Keurboomsriver, Feb. 11, 1968 (T. Schuh, J. A. & S. Slater & M. Sweet).

The specimens were taken in the same habitat as the type series of *C. herbosus*, possibly on a species of *Erharta*. However, they are more closely related to *C. variabilis* to which species they will run in our key. The tergal suture between segments four and five curves cephalad, and the wing pads are pale with a trace of membrane present. This population is very similar to *variabilis*, but in addition to having the wing pads pale it differs in having the meso- and metanotal rugosity coarser and the antennal hairs somewhat longer.

POPULATION III: 2 male, 2 female macropters; 2 male, 1 female brachypters from just south of Outeniqua Pass Summit, S. Oudtshoorn, Feb. 7, 1968 (T. Schuh, J. A. & S. Slater, M. Sweet), taken on *Scirpus costatus* Boeck.

This series will run to *C. variabilis* in our key. The connexivum is generally reddish brown and paler than the remainder of the abdominal venter. These specimens are very similar to the specimens noted above from Knysna Head but they have pale wing pads and the posterior lobe of the pronotum is completely reddish brown.

POPULATION IV: 1 male, 1 female brachypter from the Fernkloof Nature Reserve, Hermanus, Feb. 3, 1968 (J. A. & S. Slater, T. Schuh & M. Sweet), adults and nymphs taken on *Ficinia* sp.

These specimens will run to *variabilis* in our key. They will probably prove to represent an undescribed species as the vesica, including the sperm reservoir (= seminal chamber), appears to be unsclerotized, the anterior margin of the pronotum is pale and the legs are uniformly bright yellow.

POPULATION V: 1 male macropter and 1 male, 1 female brachypter from Du Toits Kloof, Paarl District, 2,000–3,500 ft., 27–28 Sept., 1959 (B. & P. Stuckenberg).

These specimens will run to *herbosus* in our key but may ultimately prove to represent one or possibly more distinct species. The male macropter has the pronotal pruinosity well developed dorsally mesad to the level of the ocelli and produced strongly mesad along the transverse impression as in *elegiae*. The antennae are unicolorous yellowish brown and the tylus slightly exceeds the distal end of the first antennal segment. The hemelytra are yellowish testaceous with a unicolorous white membrane. This specimen could represent the unknown macropter of *elegiae*. However, the two brachypters are definitely not conspecific with *elegiae*, differing in having much longer antennae, pronotal pruinosity limited to the extreme lateral margin of the pronotum, a yellow first antennal segment contrasting with the darker succeeding segments and a larger more robust body. These brachypters are more closely related to the type series of *herbosus* but differ in antennal color, somewhat in head shape and in the orangish abdomen. Unfortunately both of these brachypters are pinned through the scutellum, making it difficult to see the extent of the pruinosity. We believe it extends almost to the posterior end in one specimen, but possibly not in the other. In many ways these specimens resemble *rusticus*.

POPULATION VI: a single brachypterous female from Muizenberg Mt., 600 ft., Cape Penin., Oct. 3, 1967 (M. H. Sweet).

This specimen will run to *hirsutus* in our key. It may prove to present a distinct species. It has the pronotal pruinosity developed much as in *hirsutus* and has shining middle and posterior acetabula. However, the antennae and legs are dark reddish brown and the body is sparsely pilose and with a relatively longer posterior pronotal lobe. We feel it inadvisable to recognize this species until more material is available for study.

POPULATION VII: a single brachypterous female from Stormsrivierpiek, Tzitzikama Forest, 13.i.51, Loc. 137 (Brinck & Rudebeck).

This is the specimen reported from the above locality as *Blissus rusticus* by Slater (1964). It will run to *hirsutus* in our key. This specimen is strongly hirsute but lacks pruinosity in the transverse pronotal impression, is strongly shining dorsally and has the pronotal punctures more widely spaced. The pruinosity pattern is as in *rusticus* and *rusticoides*.

POPULATION VIII: 1 male macropter, 1 male, 2 female brachypters from Fernkloof Nature Reserve, Hermanus, Feb. 3, 1968 (J. A. & S. Slater, T. Schuh, M. Sweet), adults and nymphs on *Elegia equisetacea* Mast.

This series will run in our key to *rusticus* and agrees closely with the lectotype of *rusticus* in having dark antennae with segments two and three testaceous with the distal ends darkened. In two of the brachypters the acetabula are in part shining, in the other two specimens they are completely pruinose as in the lectotype. The macropter

is the only long winged specimen we have seen that might represent the true *rusticus*. It is coarsely punctate, rugosely so on the posterior pronotal lobe, broadly yellowish brown on the humeri and more narrowly across the posterior marginal area, has the clavus infuscated with grayish, the corium light brown on the distal fourth and laterad of the radial vein and the membrane white with the veins brown. The antennae are as in *rusticus*, and the legs bright yellow.

Unfortunately this is the only population of which we possess nymphs that could pertain to *rusticus*. These nymphs, which will be discussed in more detail in a later paper, are extremely distinct from those of any other species we have examined, possessing a dark red abdomen with a strongly contrasting black head, pronotum and wing pads. All of the other nymphs that we have studied are pale yellow, pale pink or orange. It is unfortunate that nymphs are not available from other allied populations. This should be particularly important as *rusticoides*, which on the basis of adult characters is extremely similar to *rusticus* and these related populations has completely different nymphs.

Thus there appears to be little question but that the final resolution of the status of *rusticus* will depend to a considerable extent on the association of adults and nymphs from various localities.

POPULATION IX: 3 male, 1 female brachypters from Cape Town, C. G. H., Aug. 4, 01.

These specimens will run to *rusticus* in our key. One male has antennal segments two and three subequal rather than two distinctly longer than three. The three males have the metanotal transverse rugosities finer and more numerous than is true of *rusticus* (fig. 16), but the rugosities of the female are similar to those of *rusticus*. In two males there is a narrow shining area on the pro-acetabula; otherwise the acetabula are completely pruinose as in the type series of *rusticus*. One male has the scutellar pruinosity almost attaining the posterior end of the scutellum. The female of this series has the calli more convexly produced and ovoid and there is a rather distinct transverse groove across the pronotum. The metanotal rugosity difference is striking, but if these four specimens represent a single species the condition is variable.

POPULATION X: 1 male, 1 female brachypter from Swartberg Pass, 25 miles N. of Oudtshoorn, 5,200 ft., Nov. 19, 1967 (M. H. Sweet).

These specimens will run to *rusticus* in our key. They differ from the types of *rusticus* primarily by having a narrowly granulose and somewhat rugulose area on the pronotal calli. The anterior margin of the prosternum lacks a collar-like area; the antennae are relatively pale and the acetabula are, at least in part, shining. The female has the abdominal tergum in large part ochraceous; the male dark red brown. These may well represent a distinct species but we consider it advisable to await additional material.

POPULATION XI: 1 female brachypter from Franschhoek Pass near Franschhoek, West Cape Province, Oct, 7-8.1959 (B. & P. Stuckenberg).

This specimen runs to *rusticus* in our key but probably will prove to represent a distinct species. The mesosternum is evenly pruinose, the head elongate and tapering with the bucculae conspicuous laterad of the completely orange tylus. The abdominal tergum is also completely bright orange. The wing pads have the basal half reddish and the distal half black, but this may be an artifact caused by preservation. The specimen lacks most of the legs and antennae.

POPULATION XII: 1 male brachypter from Cape Point Nature Reserve, Cape Penin., 10.xii.50, Loc. No. 79 (Brinck & Rudebeck).

This specimen will run to *rusticus* in our key.

It is a small nearly uniformly dark brown specimen with dull yellow legs and antennae. The tylus is pale anteriorly, the inner margin of the wing pads rather deeply concave, the abdomen pale only on the extreme lateral margin of the connexiva, the mesosternum shallowly excavated posteriorly and the acetabula pruinose. The metanotal rugosites are few and coarse.

POPULATION XIII: one adult female and one nymph from the summit of Bainskloof Pass, Jan. 21, 1968 (J. A. & S. Slater, T. Schuh, M. H. Sweet) on *Pentameris dregeana* Staph.

Both the adult and nymph will run to *pentameri* in our key. However this undoubtedly represents a distinct species as it is a very small insect. The labium attains the mesocoxae, the scutellar pruinosity is limited to the anterior half, the wing pads are acute, the propleural area has more pruinosity mesally than in *pentameri* but is partially shining as are the acetabula and the fore femora are mutic.

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REFERENCES

- SLATER, J. A. 1964. Hemiptera (Heteroptera) Lygaeidae. *S. Afr. Animal Life* **10**: 15-228.
- SLATER, J. A. & HARRINGTON, J. E. 1970. A revision of the genus *Ischnodemus* Fieber in the Ethiopian region (Lygaeidae, Blissinae). *Ann. Transv. Mus.* **26**: 211-275.
- SLATER, J. A. & WILCOX, D. B. 1969. A revision of the genus *Ischnodemus* in the Neotropical region (Hemiptera: Lygaeidae, Blissinae). *Misc. Publ. ent. Soc. Am.* **6**: 198-238.

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